Target: Office
at Hannover Town Hall

Saving Energy and Water
through Eco-Awareness and Action

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Foreword

The worldwide political and scientific debate on how to protect our climate directs our attention to our own homes and workplaces. By using energy more intelligently we can save energy and water without comprising on comfort, and strike a balance between quality of life and environmental gain. To make the most of these opportunities, not only in relatively manageable domestic situations but also in our Town Hall, the heart of city politics and administration, was the tremendous challenge of the ‘Target: Office’ project. We succeeded! We have exploited the energy savings potential of the Town Hall, a listed historic building that serves us well for the ceremonial side of municipal life but also as a workplace for administration offices, public services and councillors, the print shop, staff canteen and a public restaurant.
A team drawn from across the departments worked with a consultant engineer to draw up practical ways of using energy more sensibly. In contrast to some people’s image of local government staff, they do care about the environment and are very motivated and committed when brought into a team to work on practical measures.
With this report we’d like to tell you how we went about climate protection in the workplace, and to encourage you to follow suit in your town hall!

Herbert Schmalstieg
Mayor of Hannover
Hans Mönninghoff
Deputy Chief Executive and Director of Environmental Services

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1 Background

It’s common knowledge that companies and private households can reduce their consumption of electricity, heating energy and water by 10% just by acting in a more environmentally aware way and making minimal investments. But how about local government? Are such savings possible in a building such as a Town Hall with its many different uses: council chamber and other meeting rooms, offices, catering, an events programme and a range of public services?
Since the year 2000, Hannover City Council has been running the successful ‘Target: Office’ (in German: ‘Tatort Büro’) programme to exploit the energy and water savings potential in municipal buildings, initially in a pilot project with 10 divisions of the City administration, then with another 30 properties. The City saved 27,000 Euro on its utilities bills in just the first year of action.
Looking at their own housekeeping, nursing homes, libraries, a museum and an arts and community centre have also been involved along with the mainly office-based divisions.

In early 2002 the Town Hall itself, led by the corporate services division, joined the programme. This was a new field, because for the first time many different uses were being addressed within the same building. As well as four ‘paperwork’ directorates the Town Hall contains meeting rooms, formal function rooms, a kindergarten, tourist attractions, catering, a print shop and other services, all of which had to be examined. The most important, and successful, first step was to gain the cooperation of the entire staff in finding and exploiting potential savings.
The measures have not yet been completed; because of ongoing developments within the administration, including major reorganisation and the introduction of a new data processing system, modifications to the programme are constantly needed. These happen unbureaucratically on the basis laid down during the first year of operations.

Hannover Town Hall was built in 1903. It is an outstanding example of early twentieth-century Wilhelminian architecture, an expression of the pomp and ceremony of the times, and an example of exceptional craftsmanship with its ornate sandstone façade, imposing entrance hall, broad corridors, landmark dome, bay windows and artistically-designed interiors such as tapestries and mosaics. The building has been connected to a district heating system since 1963, and apart from a few modifications the control systems are around 20 years old. Some windows are still single glazed.
As part of the administration reform process, concurrently with the project all divisions of Hannover City Council administration were reorganised and the administration’s responsibilities apportioned to separate areas; there are no longer ‘Divisions’. The following documentation uses the administrative structure as it stood when the project began, as this was one of the conditions that determined its organisation. The administrative restructuring had practical consequences for the Ecoteam as responsibilities and competences of individual representatives altered, but changed nothing as far as the constitution of the team was concerned.

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PANEL:
Local government departments and uses in Hannover Town Hall in 2002
Office of the Lord Mayor
Directorate of Environmental Services
Directorate of Finance, Legal Services and Public Order
Directorate of Youth and Social Services
Directorate of Arts and Education
Directorate of Economic Affairs
General Staff Council Representatives
Corporate Services Division
Personnel and Organisation Division
Coordination, Controlling and Urban Development Division
Press and Public Information Division
Staff canteen and public restaurant
Print shop
Kindergarten
Citizens’ Information and Advice Service
Offices of the political parties
Council chamber and meeting rooms
Tourism services

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2 Concept and participants

‘Target: Office’ measures are designed to save on resources and reduce running costs without capital investment.
As an incentive to take part, 30% of the net savings by Town Hall staff are returned to their department to spend on improving the working environment, 40% is used for additional energy efficiency retrofitting, and the remaining 30% is credited to the City budget.

The Basic Idea

An ‘Ecoteam’ comprising 10 volunteers from the staff of the participating departments gets information of ways of reducing energy and water consumption, and then explores these possibilities with their immediate colleagues on such issues as

- lighting and computer use, room temperature and airing, refrigerator settings and water-saving taps
- energy-saving habits and
- practical energy saving tips.

A supervisory group looked after the project within the City administration. It comprised, along with the Energy and Climate Protection Office at the City Environmental Protection Division as lead agency

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and a technical advisor from the 'Werk-statt-Schule' energy agency, representatives from the City Construction Division, Facilities Management, and Finance Division.
The project focussed on the use of the Town Hall as a workplace for ‘office-based’ Council services, although other areas of activity also had to be addressed, and so it was above all important to promote communication among and between colleagues. The Ecoteam also offered individual advice to the EDP department, the print shop, the canteen, the telephone exchange and the caretakers and cleaners. Following up and monitoring the participating divisions ensured long-term savings and was thus a part of the project brief.

Finance

The fees of external advisors from the ‘Werk-statt-Schule’, and 1,500 Euro for small capital investments such as switched multiway connectors during the first year were provided from the budget of the Energy and Climate Protection Office, and subsequent minor investments were met from the 40% of savings by all the Hannover City Council divisions participating in ‘Target: Office’. The more the divisions saved, the more ambitious energy efficiency measures could be implemented.

The programme to replace all light bulbs in the Town Hall with energy-saving models was seen as particularly effective, and was therefore financed immediately from the building maintenance budget rather than waiting for the 40% of savings in the project's first year.

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3 The Project

3.1. Preparations
- Project information
- Motivation
- Invitations

3.2. Launch
The project target groups were invited to a launch event at the beginning of May 2002 in the Town Hall's 'Gobelinsaal' chamber. Over forty heads of division and department and staff representatives attended, a pleasingly high turnout. After an introduction by the Head of the Environmental Protection Division an external consultant explained the project, addressing
- Objectives, context, timescale
- Energy and water consumption in the Town Hall
- The Ecoteam as information multipliers and contact persons
- Methods (measuring, analysing, data exchange, identifying weak points and collecting ideas)
- Brainstorming with cards on how to save energy and water.

The first collection of ideas produced a great many practical suggestions. The meeting concluded by introducing the Ecoteam, whose eight members had been chosen in advance by colleagues in various divisions and departments, and getting approval for its role from all those present. The team also co-opted representatives from the caretaking and cleaning staff and from the Town Hall canteen and restaurant. A coordinator from the Corporate Services Division was also appointed.

3.3. Team activities
Team meetings, training, status report, changes
The Ecoteam met to exchange ideas and information, to quantify and evaluate consumption on site and to decide on economy measures. There were two meetings each on electricity, water and heating consumption, and two more meetings to prepare the day of action and the concluding event.

Day of Action
This promotion event managed to reach over 200 people, presenting the issues of water, electricity use in the office, lighting and heating with working models. Many council staff learnt about the effect of various water aerator tap attachments. Using a thermostat valve attached to tanks of coloured water it was easy to see the effect in cold weather (simulated by spraying the thermostat with cold water) or hot weather (by blowing hot air on the thermostat) of opening and closing the valve and thus demonstrate that the valve need not be altered once the working temperature has been decided.

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Various energy-saving light bulbs were demonstrated compared to incandescent bulbs, and electricity meters showed the consumption of office equipment such as PCs, monitors, printers, coffee machines and fan heaters. Switched multiway connecters were handed out and a projector ran continuous presentations backed up by a poster display. The Ecoteam used the occasion to introduce themselves to all Town Hall staff in a photo collage and posters.
At the exit to the exhibition was a suggestion box on what to do with the money from the expected energy savings.
Posters specially designed for the event encouraged staff to think about and change their attitudes to and consumption of energy and water.
During the day of action a total of 400 multiway switched sockets were distributed along with instructions for installation and optimal use. Ecoteam members followed up the day of action by approaching colleagues in the divisions and departments who had not been able to visit the exhibition.

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Intranet
To persuade as many people as possible to change their energy habits, the Ecoteam decided to follow up the day of action by other means. A project information series was placed on the City intranet page, including links to PowerPoint animations especially for the Town Hall on the correct use of printers, monitors and multiway connectors, and publications were advertised by mass mail. Together with the Town Hall IT department, the project also developed an intranet page on ‘Rules for energy-efficient EDP uses by Hannover City Council’.

3.4. Closing event
To bring the project to a fitting conclusion another invitation went out to the target groups (heads of divisions, departments, and sections and staff representatives). The Ecoteam presented, all the results and achievements of the project on projections, and discussed follow-up tasks. As only 20 people were able to attend, the results went out to other participants by internal post.

3.5. Follow-up
Since the project was wound up enquiries have gone out each year on how the measures are being continued and to promote further topics and possible savings, and

enquiries have been dealt with as they arise. The time required for this varies according to demand; currently the main topics are:

1. repair or replacement of some malfunctioning thermostat valves
2. checks followed by user briefings on energy saving modes at PC workstations during the gradual replacement of EDP equipment and operating systems
3. checks on hot water provision

3.6. Publicity and PR work

The project made the newspapers several times. For the launch, a press release and invitation to a photo opportunity in the office of Hannover's Deputy Chief Executive and Director of Environmental Services resulted in an article in the 'Neue Presse' popular daily. The Day of Action was widely reported in the regional press ('HAZ' quality daily, Neue Presse and public transport information screens), covering the Mayor's tour of the info stands and the expected savings.

At the Town Hall Open Day in August 2002 Ecoteam members were on hand to present the project to the general public and show the functioning models, measurement equipment and posters

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Timescale

February 2002:	Preliminary discussions with the Head of Corporate Services (the building manager)
March 2002:	Detailed planning with the designated Ecoteam coordinator, Preliminary information and invitations to participate in the project sent to all divisions and user groups in the Town Hall
April 2002:	First site visit by a consultant from the Werk-statt-Schule
3 May 2002:	Launch event with heads of divisions and sections, and representatives of user groups
May 2002:	Two workgroups on water saving
July 2002:	Evaluation of the questionnaire on water saving measures (to determine how many tap aerators would be needed and when to fit them etc.)
August 2002:	Two workgroups on electricity saving for the Ecoteam, one workgroup for EDP administrators
September 2002:	Cost-benefit analysis of replacing incandescent with low-energy light bulbs, clarifying the procurement procedures
October 2002:	Preparations for the Day of Action
30 October 2002:	Day of Action
November 2002:	Heating workgroup 1

December 2002:	Email campaign on heating correctly, Conversion work completed on water taps and toilet cisterns
January 2003:	In-house questionnaire on heating deficiencies (leaks, defective thermostat valves etc.)
February 2003:	Heating workgroup 2
12 March 2003:	Closing event
April 2003:	Light bulb replacement completed
21 June 2003:	Public presentation by the Ecoteam at the Town Hall Open Day

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4 The measures

4.1. Water

Water is needed in several areas of the Town Hall: the catering (staff canteen, 'Gartensaal' restaurant, servery), the public and staff toilets, wash hand basins in the toilets, staff tea and coffee-making facilities, wash hand basins in the offices, showers and in the kindergarten. The main consumers in the Town Hall are probably the catering and the toilets in equal measure. Total annual consumption is on average almost 9 million litres costing 30,000 Euro.

An inspection tour looked at all the public and staff toilets and washing facilities. The flow rate was measured at each wash hand basin and alternatives demonstrated. WC cisterns were listed according to their water-saving functions and operation. There are wall-mounted cisterns without any water saving function, with older and with newer water-saving mechanisms, and with concealed cisterns. The user cannot always tell if the cistern has a water-saving function; the flushing lever or button has to be pushed back to ensure a short flush.

Action:

Hand basins in offices were fitted with aerators (cost: 1.50 Euro each) and also limited at the angle valve to a flow volume of approx. 6 litres.

Washbasins in the toilets were fitted wherever possible with aerators that cut the flow rate to 1.7 l/min. (most taps had been set at 14 l/min). Some pressure-activated designer taps that could not be fitted with aerators were regulated to flow for between 10 and 15 seconds instead of between 7 and 37 seconds.

In the older type of toilet cistern a weight was installed to counterbalance the lever action, so that the flush worked only as long as the handle was held down. Stickers affixed to the cisterns explained this.

Additionally, Ecoteam members were charged with explaining the water saving measures at routine staff meetings. The house technicians noted water consumption at the three water meters each week.

Results:
After the conversion work in October 2002 water consumption decreased markedly, from 25 to just over 22m^3 a day, and these economies have been sustained. Even at special events such as the Town Hall open day or the Hannover Marathon, bringing an enormous increase in visitors and high water consumption, meters showed lower water use than in previous years.

4.2. Electricity
Average annual electricity consumption of the Town Hall is between 1,000,000 and 1,200,000 kWh, costing the city around 125,000 Euro.
Most of this electricity is used in offices, and so the main focus of investigations was on PCs and peripherals, copiers and lighting.
The Ecoteam met twice to discuss action on electricity saving, and there was also a workgroup for computer administrators.

Office technology:
First, in the computer training rooms the electricity consumption of various office equipment in different modes was measured.
On the subject of copiers, lighting, and reading the periodic load meter, specific appointments were made with individual members of the Ecoteam.

Results:
The significant consumption in 'stand-by' mode and the measurable consumption by equipment that was switched off was a strong motivation to act.
To stop the 'switched-off' equipment consuming electricity, switched multiway connectors were distributed at a cost of about 2 Euro per workplace, to be inserted between the equipment and the mains supply. All equipment at the workplace could thus be switched off completely at night and weekends. After 15 minutes of inactivity the VDU should be closed down. This does not affect its working life, even when the screen is switched on and off 10 times a day. Laser printers should only be switched on when needed.
Installation of 'ecoman' automatic closedown attachments for the screens was rejected because in the medium term it was probable that the WinNT operating system would be superseded by others such as WinXP with their own power management systems. Administrators should make this change on all Town Hall computers that already have WinXP.
Copiers, another electricity wastage culprit at the Town Hall, are often switched on round the clock and have no power management functions. Here, an automatic time switch, closing down between 7 pm and 6 am and at weekends, and notices by the machines can help.

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4 The measures

Savings from office equipment:
Office electricity consumption was estimated at around 1,039 kWh per working day – but the measures described above reduced this to as little as 430 kWh per working day. This potential saving cannot be achieved by a one-off measure but depends on the long-term commitment of the users. Now that many sections have been equipped with powerful new computers using more electricity and the Window XP system, it is intended to run another check and a users information campaign to sustain the savings potential. Because the new equipment draws more power, thoughtlessness, such as leaving it switched on even when it is not needed, could lead to even higher unnecessary consumption than before.

Lighting:
A house inspection made it plain that lighting on the corridors, in meeting rooms and other historically-important function rooms offered another great opportunity to save electricity by replacing conventional light bulbs with energy-saving bulbs. Alternative types of bulb were discussed and the cost effectiveness of the measures calculated. For each type of lighting in the public areas a few low-energy light bulbs were installed on a trial basis. The Mayor assessed the proposals and made the final selection.

Results:
In total around 440 light bulbs were replaced, and savings of around 42,000 kWh per year are expected. This will also save staff time as the new bulbs will be replaced much less often; especially in the historic council chambers with their high ceilings and ornate wall lights, replacing bulbs is very time consuming.
To keep a closer check on electricity consumption, lists were devised to monitor and calculate at the meters. One initial problem was to read the periodic load meter correctly, as this was designed to be monitored remotely and the house technical staff could not access the data. Determining the EDIS (Energy Data Identification System) code made a normal meter reading possible.
Analysis of refrigerators, water heaters, lifts and small appliances was not possible in the time available. These consumers will be assessed during the follow-up.

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4.3. Heating
The Town Hall shares a district heating supply with its neighbours, the Construction Directorate and the Kestner Museum, and these buildings took part in the heating part of the project. Depending on weather conditions, heating the Town Hall consumes around 3,200,000 kWh a year at a cost of about 200,000 Euro. First, the Ecoteam gathered information on the functioning of thermostat valves, heating controls, overnight

temperatures, correct ventilation, and the effect of blocking radiators with shelves or files. Findings from long-term temperature monitoring in different parts of the Town Hall were presented and general rules on heating discussed.
The standard office working temperatures in all municipal buildings are, according to (old) regulations, 20° C one hour after work begins and 19° before that, 17° on corridors and 15° in toilets. These regulations are seldom observed within the city administration; the room temperature is often too high. This is particularly true during the night and at weekends, when most rooms are generally unoccupied. To help staff keep a check on their own rooms, many thermometers were distributed.
The Ecoteam decided to match the heating period more closely to the use period and in general to reduce night-time temperatures further.
The heating system is controlled and monitored by the house technical services with two computer programmes. First it was important to determine the use periods for the heating cycle.

Results:
Heating and ventilation for the council chamber and committee rooms were adjusted at the control computer to meet the need while they were actually being used. The 'special' rooms (offices of the Mayor and his staff, the Gartensaal restaurant) had to be excluded from this as they are used over the weekend. Exceptional uses, such as during elections, are foreseeable and can be programmed into the system. Allotting every room to one of the 26 heating cycles was sometimes difficult, as the original room numbering had been changed sometime in the past.
Nevertheless, in several cycles the night temperature reduction could be changed from 10 Kelvins to 20 Kelvins and the reduction brought forward from, in some cases, 9:30 or 10 pm to 5 or 6 pm.
In the Citizens Advice and Information Bureau the function of the heating controls was explained, because this area has its own computerised controls and a remote control function that the staff were unaware of.

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Defects lists
A checklist was distributed to all rooms for reporting all defective windows, doors or missing thermostat valves on radiators. This survey also asked whether, in rooms with single glazed windows, the staff wanted insulation film as provisional double glazing. This is effective as an energy saver but is often rejected because it is seen as ugly.

Information posters
Several striking posters from the European 'Energyoffice' campaign, on 'Airing properly', 'Radiator thermostats', ‘Continuous ventilation' and 'Warm clothes' were placed on the city intranet.
Follow-up
Room temperatures were re-checked in several areas. Hot water provision also needs to be checked.

4 The measures

4.4. Catering

The project was not able to examine the Town Hall catering services (the staff canteen and the 'Gartensaal' public restaurant) as fully as it could the more typical municipal administration areas, and so action was restricted to a tour of inspection with the Head of Catering Services, who was also an Ecoteam member.

The canteen is open at lunchtime on working days, and the Gartensaal is open to the public all day every day. Cooking and keeping food hot is all done by electricity; there is no gas supply. Dishwashing and pre-rinsing is efficient as regards energy and water consumption, although electricity could be saved by connection to a hot water supply. A top grill was left switched on whenever the staff were working i.e., the heating coils were glowing for most of time. As the appliance heats up very quickly it would be possible and sensible to switch it off when not needed.

Two areas of operations in the kitchens were addressed more fully: refrigeration and keeping food hot.

Refrigeration

The inspection looked at cold stores and deep freeze rooms, drinks refrigerators, and service counters, comparing actual with statutory temperatures and identifying possible savings by adjusting regulators to the temperatures required by the international HACCP hygiene standards, the food safety regulations and the respective use periods.

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As it is often the case with large catering facilities, the temperature settings had been well below what was necessary to meet food safety regulations. Generally, unnecessarily low temperatures should be avoided to save energy; as a rule of thumb, every degree below the required temperature means an extra 6% on the electricity consumption. Cold stores should not be several degrees colder than required just to get back to temperature 'faster' after the door has been opened. The cooling train switches on the compressor fully even at slight deviations from the set temperature; setting a lower temperature does not speed up this process. Because only the air temperatures and not the core temperatures of refrigerators and freezers change so quickly it should be sufficient to set thermostats close to the HACCP standard. To be on the safe side, any change should be monitored at first by recording the core temperatures.

Keeping food hot

Ten hot boxes rated at 500W are used for deliveries to external customers. Pre-heated water keeps the food at the required temperature of over 65° for up to 2 hours in accordance with HACCP regulations. It was unclear for how long the boxes were heated before filling, and this will be recorded by the staff who switch the boxes on each day; perhaps there are potential savings from heating nearer the time that the boxes are needed.

4.5. Print shop

An inspection of the Town Hall print shop revealed that staff were not fully aware of how the warm-air ventilation, necessary because the print shop uses volatile solvents, functioned.
Questions could be answered on the spot. Two air conditioning units had been running at maximum temperature. This was not necessary, although the units must run at level 1 or there will be problems with the moisture content of the paper. A 5-litre boiler was reset to 35° C.
The print shop will get two new smaller and more energy-efficient printing and copying machines.

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5 Taking stock and looking ahead

This successful project demonstrated clearly that focusing on changing habits and making minor technical improvements to save energy and water is effective even in a complex building such as a Town Hall. Despite the many and varied requirements deriving from the duties and responsibilities of Town Hall staff and departments - the reception rooms of the Mayor and City Council, local government administration with its many departments, a public restaurant, the print shop, further complicated by the building's status as a listed historic building and tourist attraction - all sorts of ways of saving energy and water were found.
The commitment and team spirit of the Ecoteam members, who usually had little contact in the normal course of their duties, exceeded all expectations. Feedback from their colleagues was consistently positive, and many measures could be implemented quickly and unbureaucratically.
Nevertheless, the job is by no means over. For one thing there are still some measures on the list to be completed. For another, during the project it became plain that there will always be changes in the nature of the work to respond to if we wish to keep optimising energy and water consumption. One example is EDP. The project has opened possibilities of responding quickly to change, as the Ecoteam is still a representative group, drawn from the Town Hall staff, that can pass on new information quickly and unbureaucratically and for their part report their observations to the Energy and Climate Protection Office. In this way the follow-up process can run very effectively without time-consuming appointments or workgroup meetings.
To evaluate the success of the project correctly from meter readings, however, one must also take specific uses of the building or its rooms over a period into account, as special events have a major effect on energy and water consumption.

Backpage

The Lord Mayor
Environment and City Greenspace

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